

## Abstract

5 An interlaced to progressive scan video converter which identifies object edges  
and directions, and calculates new pixel values based on the edge information. Source image  
data from a single video field is analyzed to detect object edges and the orientation of those  
edges. A 2-dimensional array of image elements surrounding each pixel location in the field is  
high-pass filtered along a number of different rotational vectors, and a null or minimum in the set  
of filtered data indicates a candidate object edge as well as the direction of that edge. A 2-  
10 dimensional array of edge candidates surrounding each pixel location is characterized to  
invalidate false edges by determining the number of similar and dissimilar edge orientations in  
the array, and then disqualifying locations which have too many dissimilar or too few similar  
surrounding edge candidates. The surviving edge candidates are then passed through multiple  
low-pass and smoothing filters to remove edge detection irregularities and spurious detections,  
yielding a final edge detection value for each source image pixel location. For pixel locations  
with a valid edge detection, new pixel data for the progressive output image is calculated by  
interpolating from source image pixels which are located along the detected edge orientation.